Center Independent Research & Development: JPL IRAD

Combining Power and Data using Powerline Communication for Harness Simplification and Mass Reduction

Completed Technology Project (2015 - 2016)

Project Introduction

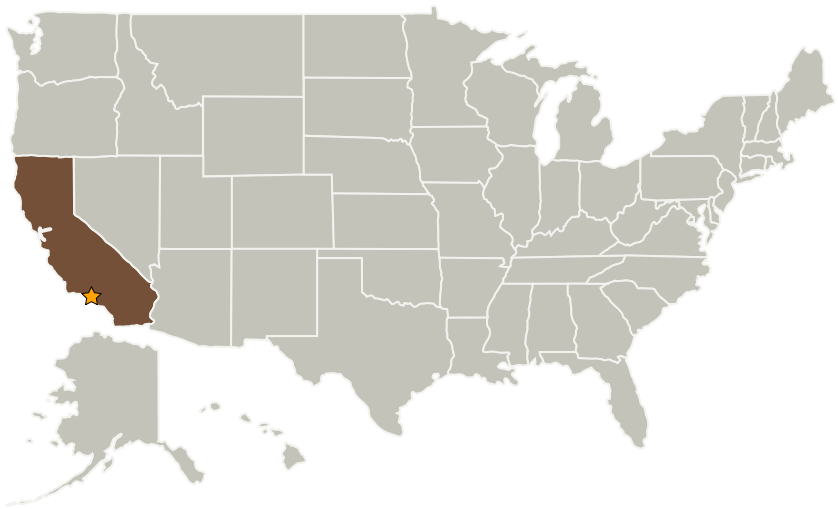
The challenge of this task is to eliminate dedicated communication wires to powered instruments and electronic devices. It will demonstrate realistic data and power transfer over common harness conductors to provide control and telemetry and determine Electromagnetic Compatibility with the power bus and spacecraft environments.

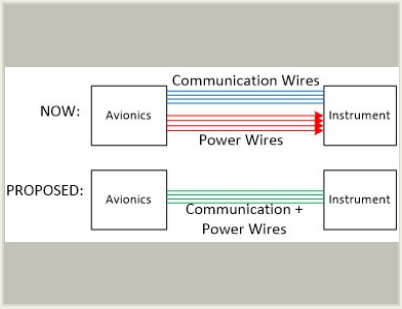
The task approach is to carry communication signals over the existing power distribution cables using Powerline Communications Technology and to eliminate all dedicated communications harnessing, resulting in reduced mass, volume, implementation cost. Major milestones: 1. Power bus noise and signal compatibility evaluation. Rates, filtering and protocol determination. Electronic part evaluation and board design. 2. Power line T0 testbed with prototype power line node and EMI/EMC Testing 3. Demonstration of power line control in relevant EMI/EMC instrument (advanced mirror control)

Anticipated Benefits

This technology provides •T-zero launch vehicle connections for all spacecraft. •Avionics to Instrument interfaces for all spacecraft •Control of multi-segmented mirrors

Primary U.S. Work Locations and Key Partners





Project Image Combining Power and Data using Powerline Communication for Harness Simplification and Mass Reduction

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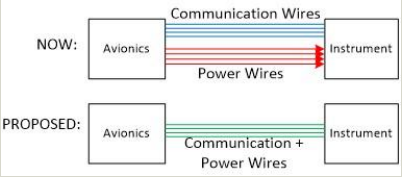
Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Images



Combining Power and Data using Powerline Communication
Project Image Combining Power and Data using Powerline Communication for Harness Simplification and Mass Reduction *(https://techport.nasa.gov/image/26086)*

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Jet Propulsion Laboratory (JPL)

Responsible Program:
Center Independent Research & Development: JPL IRAD

Project Management

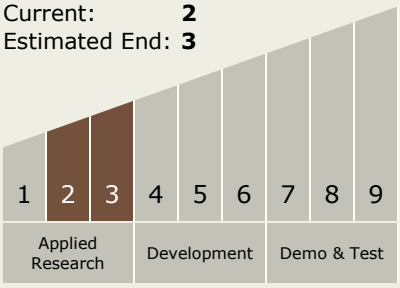
Program Manager:
Fred Y Hadaegh

Project Manager:
Fred Y Hadaegh

Principal Investigator:
Luke A Dubord

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **3**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.1 Management and Control